

CLAIMS

We claim:

1. A composition comprising a modulator of FGFR5 gene expression wherein said modulator is selected from the group consisting of: (a) a small molecule inhibitor of gene expression, (b) an anti-sense oligonucleotide, and (c) a small interfering RNA molecule (siRNA or RNAi).

2. The composition of claim 1 wherein said modulator of FGFR5 gene expression specifically binds to a polynucleotide selected from the group consisting of: (a) a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; (b) a complement of a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; (c) a reverse sequence of a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; (d) a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; (e) a complement of a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8, 13-15, : 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89,

91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; and (f) a reverse sequence of a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

3. The composition of claim 1 or claim 2 wherein said modulator of FGFR5 gene expression is effective in decreasing FGFR5 gene expression when contacted with a population of cells expressing FGFR5.

4. The composition of claim 3 wherein said modulator of FGFR5 gene expression is effective in decreasing osteopontin gene expression when contacted with a population of cells expressing FGFR5.

5. The composition of claim 1 or claim 2 wherein said modulator of FGFR5 gene expression is an anti-sense oligonucleotide and wherein said anti-sense oligonucleotide is selected from the group consisting of: (a) an anti-sense expression vector; (b) an anti-sense oligodeoxyribonucleotide, (c) an anti-sense phosphorothioate oligodeoxyribonucleotide, (d) an anti-sense oligoribonucleotide, and (e) an anti-sense phosphorothioate oligoribonucleotide.

6. A composition comprising a binding agent wherein said binding agent is a modulator of FGFR5 polypeptide function and wherein said binding agent is selected from the group consisting of: (a) a small molecule; (b) an antibody or antigen-binding fragment thereof; (c) a small chain antibody fragment (scFv); (d) a camelid heavy chain antibody (HCAb) or heavy chain variable domain thereof (V_{HH}); and (e) an FGFR5 ligand or antigen-binding fragment thereof.

7. The composition of claim 6 wherein said binding agent specifically binds to a polypeptide selected from the group consisting of: (a) a polypeptide encoded by a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4 and 9 or a complement thereof; and (b) a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8 and 13-15.

8. The composition of claim 6 or claim 7 wherein said binding agent is an agonist of FGFR5 polypeptide function.

9. The composition of claim 8 wherein said agonist of FGFR5 polypeptide function is effective in increasing osteopontin gene expression in a population of cells expressing FGFR5 polypeptide when said agonist is contacted with said population of cells.

10. The composition of claim 6 or claim 7 wherein said binding agent is an antagonist of FGFR5 polypeptide function.

11. The composition of claim 10 wherein said antagonist of FGFR5 polypeptide function is effective in decreasing osteopontin gene expression in a population of cells expressing FGFR5 polypeptide when said antagonist is contacted with said population of cells.

12. A method for modulating osteopontin expression in a population of cells, said method comprising the step of contacting said population of cells with the composition of claim 1.

13. The method of claim 12 wherein said modulator of FGFR5 gene expression specifically binds to a polynucleotide selected from the group consisting of: (a) a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100,

102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; (b) a complement of a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; (c) a reverse sequence of a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; (d) a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; (e) a complement of a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8, 13-15, : 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; and (f) a reverse sequence of a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

14. The method of claim 12 wherein said modulator of FGFR5 gene expression is effective in decreasing FGFR5 gene expression when contacted with a population of cells expressing FGFR5.

15. The method of claim 12 wherein said modulator of FGFR5 gene expression is effective in decreasing osteopontin gene expression when contacted with a population of cells expressing FGFR5.

16. The method of claim 12 wherein said modulator of FGFR5 gene expression is an anti-sense oligonucleotide and wherein said anti-sense oligonucleotide is selected from the group consisting of: (a) an anti-sense expression vector; (b) an anti-sense oligodeoxyribonucleotide, (c) an anti-sense phosphorothioate oligodeoxyribonucleotide, (d) an anti-sense oligoribonucleotide, and (e) an anti-sense phosphorothioate oligoribonucleotide.

17. A method for modulating osteopontin expression in a population of cells, said method comprising the step of contacting said population of cells with the composition of claim 6.

18. The method of claim 17 wherein said binding agent specifically binds to a polypeptide selected from the group consisting of: (a) a polypeptide encoded by a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4 and 9 or a complement thereof; and (b) a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8 and 13-15.

19. The method of claim 17 wherein said binding agent is an agonist of FGFR5 polypeptide function and wherein binding of said agonist to said population of cells results in an increase in osteopontin expression when said agonist is contacted with said population of cells.

20. The method of claim 17 wherein said binding agent is an antagonist of FGFR5 polypeptide function and wherein binding of said an antagonist to said population of cells results in a decrease in osteopontin expression when said antagonist is contacted with said population of cells.

21. A use of a modulator of FGFR5 gene expression in a medicament for the treatment of a disease associated with elevated osteopontin expression.

22. The use of a modulator of FGFR5 gene expression of claim 21 wherein said modulator is selected from the group consisting of: (a) a small molecule inhibitor of gene expression, (b) an anti-sense oligonucleotide, and (c) a small interfering RNA molecule (siRNA or RNAi).

23. The use of a modulator of FGFR5 gene expression of claim 21 wherein said modulator specifically binds to a polynucleotide selected from the group consisting of: (a) a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4 and 9; (b) a complement of a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4 and 9; (c) a reverse sequence of a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4 and 9; (d) a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8 and 13-15; (e) a complement of a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8 and 13-15; and (f) a reverse sequence of a polynucleotide that encodes a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8 and 13-15.

24. The use of a modulator of FGFR5 gene expression of claim 21 wherein said disease associated with elevated osteopontin expression is selected from the group consisting of cancer, multiple sclerosis; systemic lupus erythematosus; diabetes; rheumatoid arthritis; sarcoidosis; tuberculosis; kidney stones; atherosclerosis; vasculitis; nephritis; arthritis; and osteoporosis.

25. A use of a binding agent in a medicament for the treatment of a disease associated with elevated osteopontin expression wherein said binding agent is an antagonist of FGFR5 polypeptide function and wherein said binding agent is selected from the group consisting of: (a) a small molecule; (b) an antibody or antigen-binding

fragment thereof; (c) a small chain antibody fragment (scFv); and (d) a camelid heavy chain antibody (HCAb) or heavy chain variable domain (V_{HH}) thereof.

26. The use of a binding agent of claim 25 wherein said binding agent specifically binds to a polypeptide selected from the group consisting of: (a) a polypeptide encoded by a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4 and 9 or a complement thereof; and (b) a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8 and 13-15.

27. The use of a binding agent of claim 25 wherein said disease associated with elevated osteopontin expression is selected from the group consisting of cancer; multiple sclerosis; systemic lupus erythematosus; diabetes; rheumatoid arthritis; sarcoidosis; tuberculosis; kidney stones; atherosclerosis; vasculitis; nephritis; arthritis; and osteoporosis.

28. A use of a binding agent in a medicament for the treatment of a disease associated with reduced osteopontin expression wherein said binding agent is an agonist of FGFR5 polypeptide function and wherein said binding agent is selected from the group consisting of: (a) a small molecule; (b) an antibody or antigen-binding fragment thereof; (c) a small chain antibody fragment (scFv); (d) a camelid heavy chain antibody (HCAb) or heavy chain variable domain (V_{HH}) thereof; and (e) an FGFR5 ligand or FGFR5-binding fragment thereof.

29. The use of a binding agent of claim 28 wherein said binding agent specifically binds to a polypeptide selected from the group consisting of: (a) a polypeptide encoded by a polynucleotide comprising a sequence selected from the group consisting of SEQ ID NO: 1-4 and 9 or a complement thereof; and (b) a polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8 and 13-15.

30. The use of a binding agent of claim 28 wherein said disease associated with reduced osteopontin expression is selected from the group consisting of osteopetrosis.

31. A method for the treatment of a disease associated with elevated osteopontin expression, said method comprising the step of administering to a patient a composition according to claims 1 or claim 6.

32. A method for the treatment of cancer in a patient, said method comprising the step of administering to said patient a composition according to claim 1 or claim 6 wherein said cancer is selected from the group consisting breast cancer, hepatocellular carcinoma, and colon cancer.

33. A method for the treatment of a bone disorder in a patient, said method comprising the step of administering to said patient a composition according to claim 1 or claim 6 wherein said bone disorder is selected from the group consisting osteoporosis and osteopetrosis.

34. A method for the treatment of an FGFR5-associated disorder in a patient, said method comprising the step of administering to said patient a composition according to claim 1 or claim 6.

35. A method for inhibiting the expression of osteopontin in a population of cells, comprising reducing the amount of a polypeptide in the cells, the polypeptide comprising an amino acid sequence selected from the group consisting of:

- (a) a sequence provided in SEQ ID NO: 5-8 and 13-15;
- (b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15
- (c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15; and

(d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15.

36. A method for inhibiting the expression of osteopontin in a population of cells, comprising the step of inhibiting the activity of a polypeptide in said population of cells by administering a composition of claim 6 wherein said polypeptide comprising an amino acid sequence selected from the group consisting of:

- (a) a sequence provided in SEQ ID NO: 5-8 and 13-15;
- (b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15;
- (c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15; and
- (d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15.

37. A method for treating a disorder characterized by an elevated level of osteopontin, comprising the step of administering a composition of 6 wherein said composition comprises a binding agent that specifically to a polypeptide comprising an amino acid sequence selected from the group consisting of:

- (a) sequences provided in SEQ ID NO: 5-8 and 13-15;
- (b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15;
- (c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15; and
- (d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15.

38. A method for treating a disorder characterized by an elevated level of osteopontin, comprising administering a composition of claim 1 said composition comprises a modulator of FGFR5 gene expression that binds specifically to a polynucleotide comprising a sequence selected from the group consisting of:

- (a) sequences provided in SEQ ID NO: 1-4 and 9;
- (b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 1-4 and 9;
- (c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 1-4 and 9; and
- (d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: 1-4 and 9.

39. The method of any one of claims 35-38, wherein the disorder is selected from the group consisting of: cancer; multiple sclerosis; systemic lupus erythematosus; diabetes; rheumatoid arthritis; sarcoidosis; tuberculosis; kidney stones; atherosclerosis; vasculitis; nephritis; arthritis; and osteoporosis.

40. An isolated polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO: 5-8 and 13-15.

41. An isolated polypeptide comprising a sequence selected from the group consisting of:

- (a) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15;
- (b) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15; and
- (c) sequences having at least 95% identity to a sequence provided in SEQ ID NO: 5-8 and 13-15,

wherein the polypeptide possesses at least one functional property that is substantially the same as a functional property of a sequence of SEQ ID NO: 5-8 and 13-15.

42. An isolated polypeptide comprising a sequence selected from the group consisting of: SEQ ID NOs:

17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

43. An isolated polypeptide comprising a sequence selected from the group consisting of:

(a) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(b) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; and

(c) sequences having at least 95% identity to a sequence provided in SEQ ID NO: 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143,

wherein the polypeptide possesses at least one functional property that is substantially the same as a functional property of a sequence of SEQ ID NO: 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

44. An isolated polynucleotide that encodes a polypeptide according to any one of claims 1-4.

45. An isolated polynucleotide of claim 5, wherein the polynucleotide comprises a sequence selected from the group consisting of: sequences provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68,

70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142.

46. An isolated polynucleotide comprising a sequence selected from the group consisting of:

(a) complements of a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(b) reverse complements of a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(c) reverse sequences of a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(d) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; and

(e) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; and

(f) sequences having at least 95% identity to a sequence of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142.

47. An isolated polynucleotide comprising a sequence selected from the group

consisting of: (a) sequences that are a 200-mer of an isolated polynucleotide according to any one of claims 5, 6 and 7; (b) sequences that are a 100-mer of an isolated polynucleotide according to any one of claims 5, 6 and 7; and (c) sequences that are a 40-mer of an isolated polynucleotide according to any one of claims 5, 6 and 7.

48. An expression vector comprising an isolated polynucleotide according to any one of claims 5-7.

49. A host cell transformed with an expression vector according to claim 9.

50. An isolated polypeptide comprising at least a functional portion of an amino acid sequence selected from the group consisting of sequences provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

51. A fusion protein comprising at least one polypeptide according to any one of claims 1-4 and 11.

52. A composition comprising an isolated polypeptide according to any one of claims 1-4 and 11 and at least one component selected from the group consisting of: physiologically acceptable carriers and immunostimulants.

53. A composition comprising an isolated polynucleotide according to any one of claims 5-8 and at least one component selected from the group consisting of: physiologically acceptable carriers and immunostimulants.

54. A composition comprising a fusion protein according to claim 12 and at least one component selected from the group consisting of: physiologically acceptable carriers and immunostimulants.

55. A method for the treatment of a disorder of the immune system in patient, comprising administering to the patient a composition according to any one of claims 13-15.

56. A method for the treatment of cancer in a patient, comprising administering to the patient a composition according to any one of claims 13-15, wherein the cancer is selected from the group consisting of epithelial, lymphoid, myeloid, stromal and neuronal cancers.

57. A method for the treatment of a viral disorder in a patient, comprising administering to the patient a composition according to any one of claims 13-15.

58. The method of claim 17, wherein the viral disorder is HIV-infection.

59. A method for the treatment of a fibroblast growth factor-mediated disorder in a patient, comprising administering a composition according to any one of claims 13-15.

60. A method for modulating an immune response in a patient, comprising administering to the patient a composition according to any one of claims 13-15.

61. A method for inhibiting the expression of osteopontin in a population of cells, comprising reducing the amount of a polypeptide in the cells, the polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47,

49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; and

(d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

62. A method for inhibiting the expression of osteopontin in a population of cells, comprising inhibiting the activity of a polypeptide in the cells, the polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; and

(d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

63. The method of claim 22, wherein the method comprises contacting the cells with an antibody, or an antigen-binding fragment thereof that binds specifically to a polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; and

(d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

64. The method of claim 23, wherein the method comprises contacting the cells with an anti-sense oligonucleotide that binds specifically to a polynucleotide comprising a sequence selected from the group consisting of:

(a) sequences provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62,

64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; and

(d) sequences having at least 95% identity to a sequence of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142.

65. The method of claim 23, wherein the method comprises contacting the cells with a small interfering RNA molecule that corresponds to a polynucleotide comprising a sequence selected from the group consisting of:

(a) sequences provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; and

(d) sequences having at least 95% identity to a sequence of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142.

66. A method for treating a disorder characterized by an elevated level of osteopontin, comprising administering an antibody, or an antigen-binding fragment thereof that binds specifically to a polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; and

(d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

67. A method for treating a disorder characterized by an elevated level of osteopontin, comprising administering an anti-sense oligonucleotide that binds specifically to a polynucleotide comprising a sequence selected from the group consisting of:

(a) sequences provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62,

64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; and

(d) sequences having at least 95% identity to a sequence of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142.

68. A method for treating a disorder characterized by an elevated level of osteopontin, comprising administering a small interfering RNA molecule that corresponds to a polynucleotide comprising a sequence selected from the group consisting of:

(a) sequences provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142; and

(d) sequences having at least 95% identity to a sequence of SEQ ID NO: 1-4, 9, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, and 142.

69. The method of any one of claims 27-29, wherein the disorder is selected from the group consisting of: multiple sclerosis; systemic lupus erythematosus; diabetes; rheumatoid arthritis; sarcoidosis; tuberculosis; kidney stones; atherosclerosis; vasculitis; nephritis; arthritis; and osteoporosis.

70. An antibody that specifically binds to a polypeptide selected from the group consisting of:

(a) a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(b) sequences having at least 75% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143;

(c) sequences having at least 90% identity to a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143; and

(d) sequences having at least 95% identity to a sequence provided in SEQ ID NO: ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.

71. The antibody of claim 31 wherein said antibody specifically binds to a polypeptide selected from the group consisting of: a sequence provided in SEQ ID NO: 5-8, 13-15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, and 143.